



# Red Hat Network Satellite (On System z)

**18-JUNE CAVMEN Meeting**



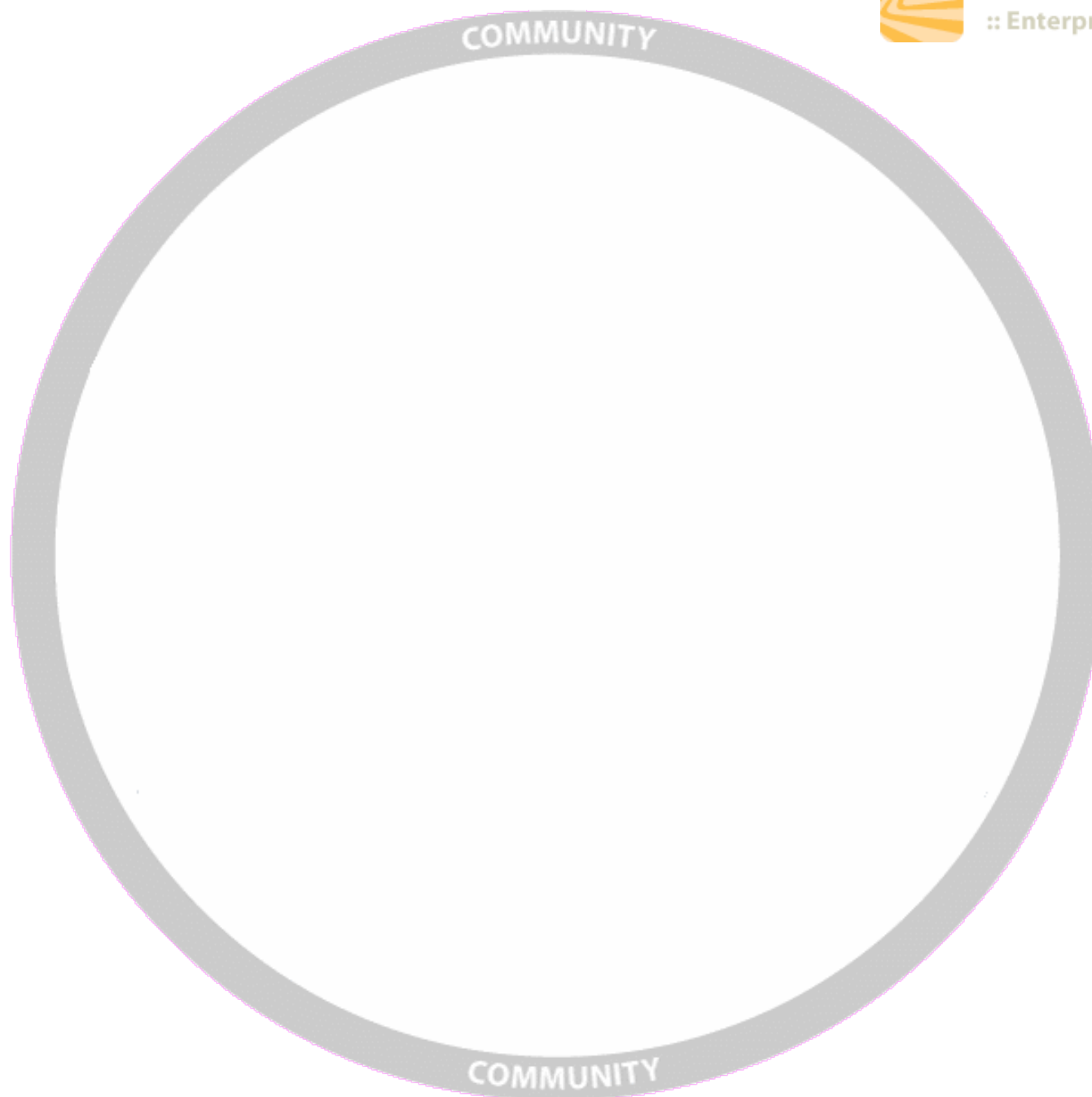
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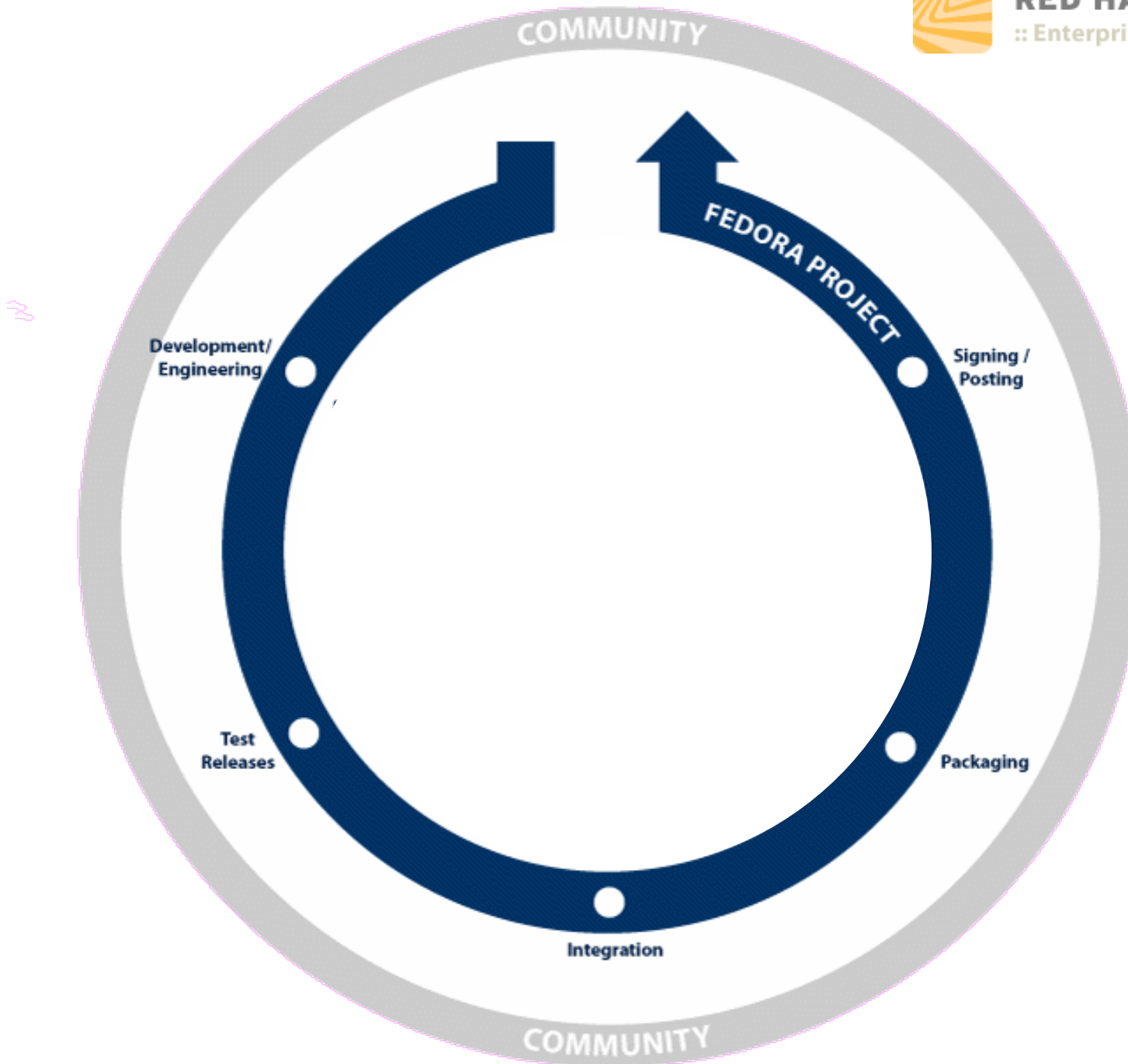


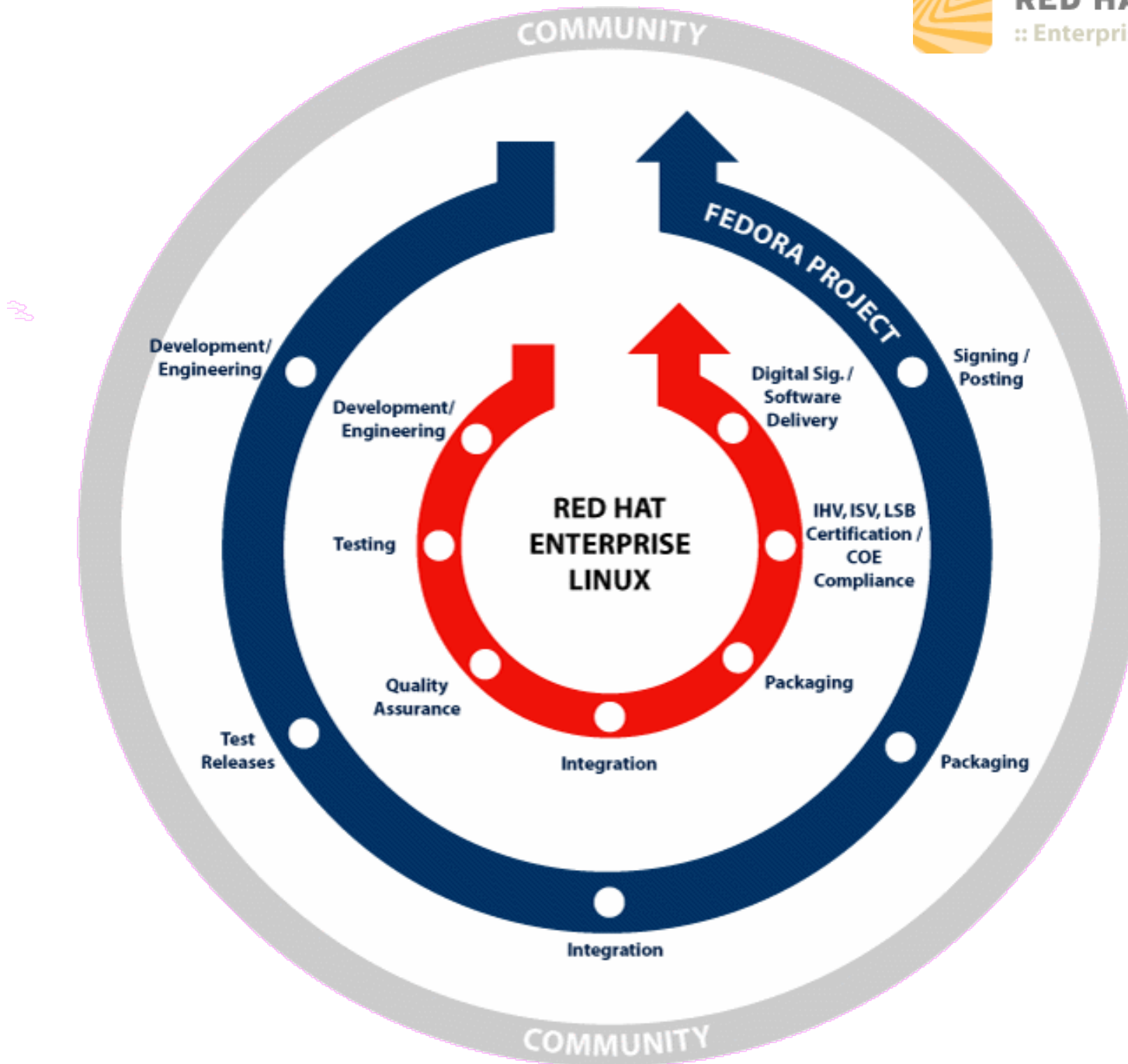
# Why are we here?

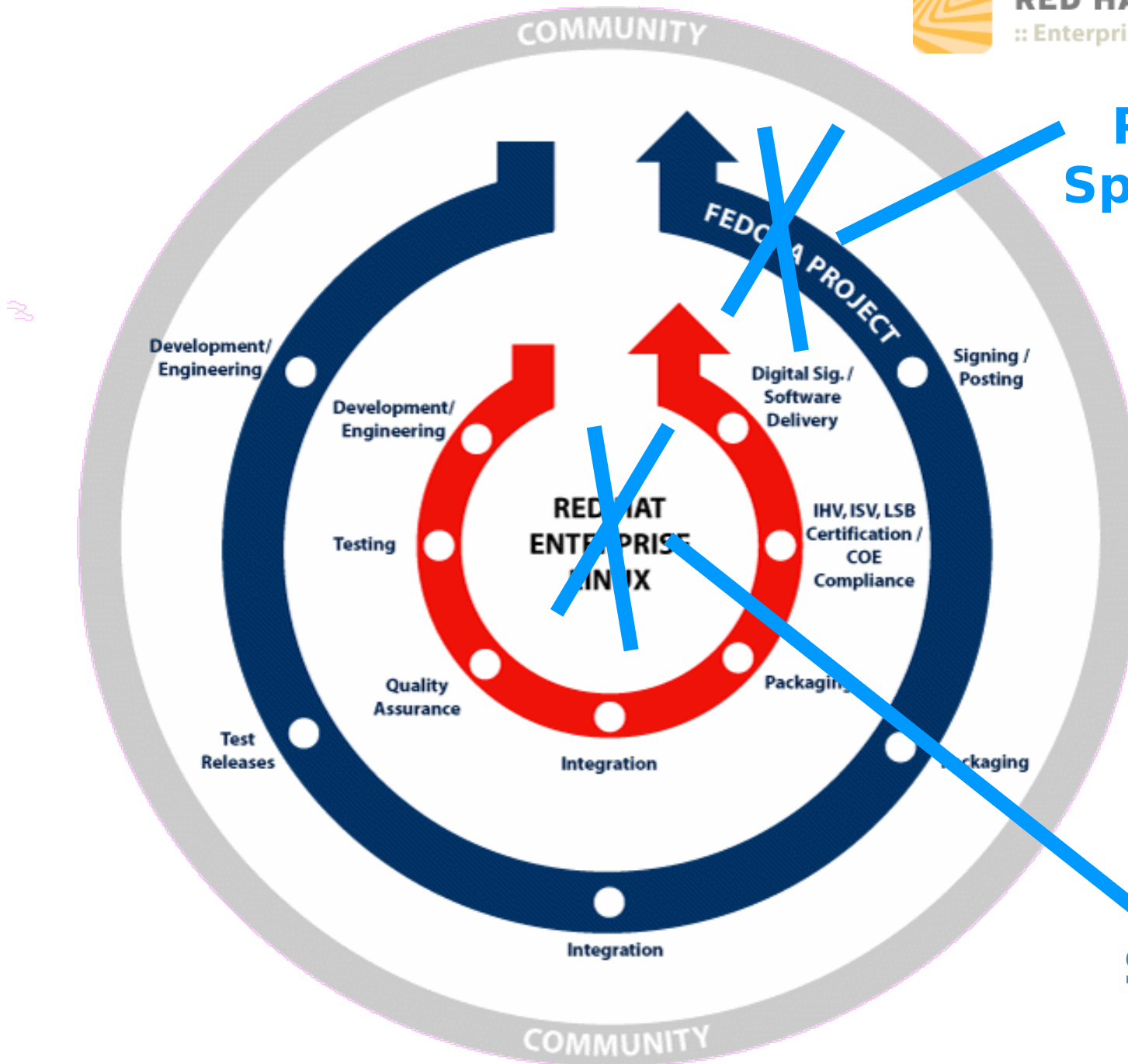
## PROBLEM SCENARIO

- SysAdmin wants to automate Linux updating, monitoring, provisioning, and overall management









**Project  
Spacewalk**

**RHN  
Satellite**



# What Does RHN Satellite Do?



# Red Hat Network

**A system management platform designed to provide complete lifecycle management of the operating system and applications.**

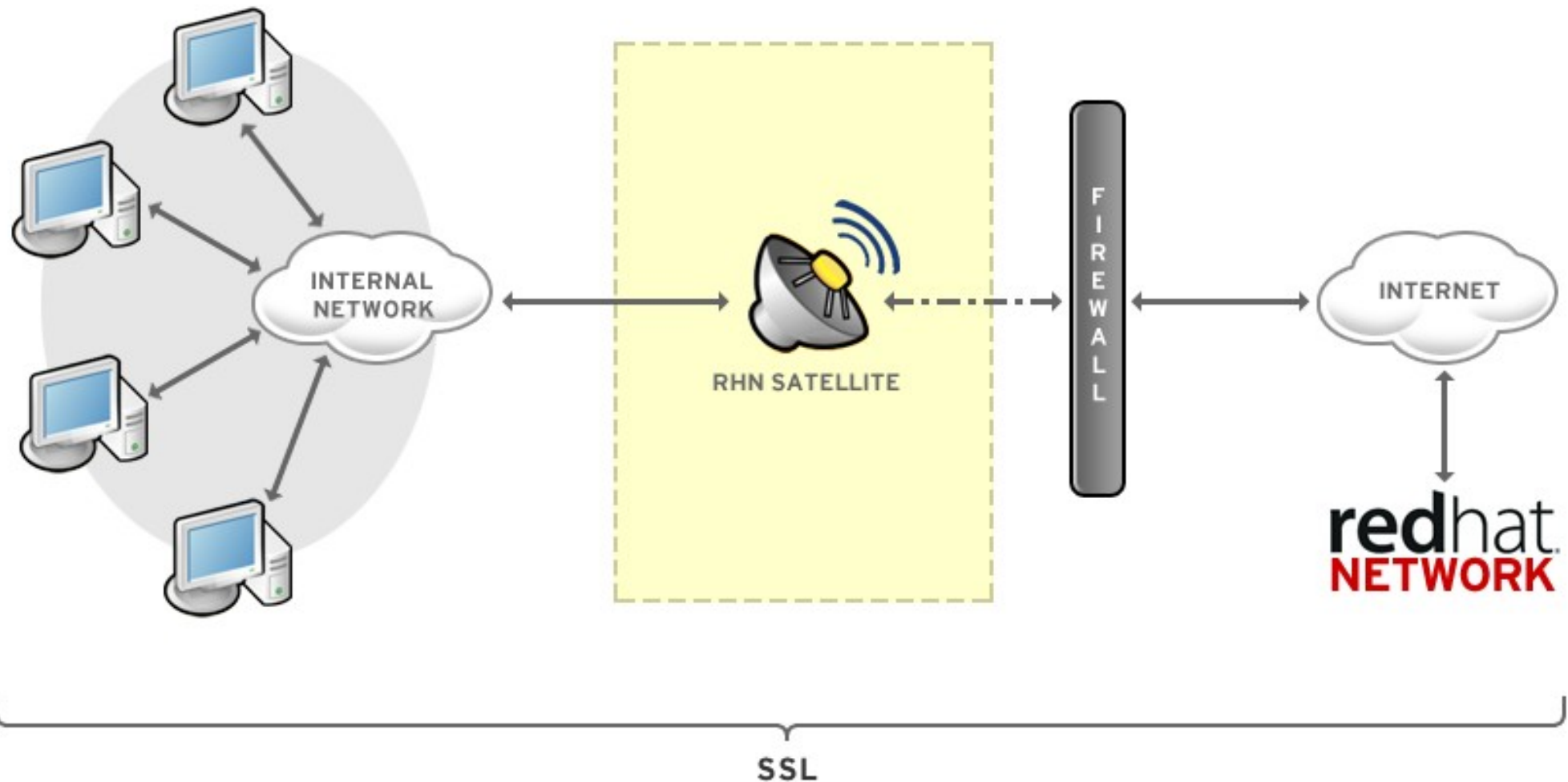
- A single solution for lifecycle management of compute resources
  - Installing and provisioning new systems
  - Updating systems
  - Managing configuration files
  - Monitoring performance
  - Redeploying for a new purpose





## RHN SATELLITE

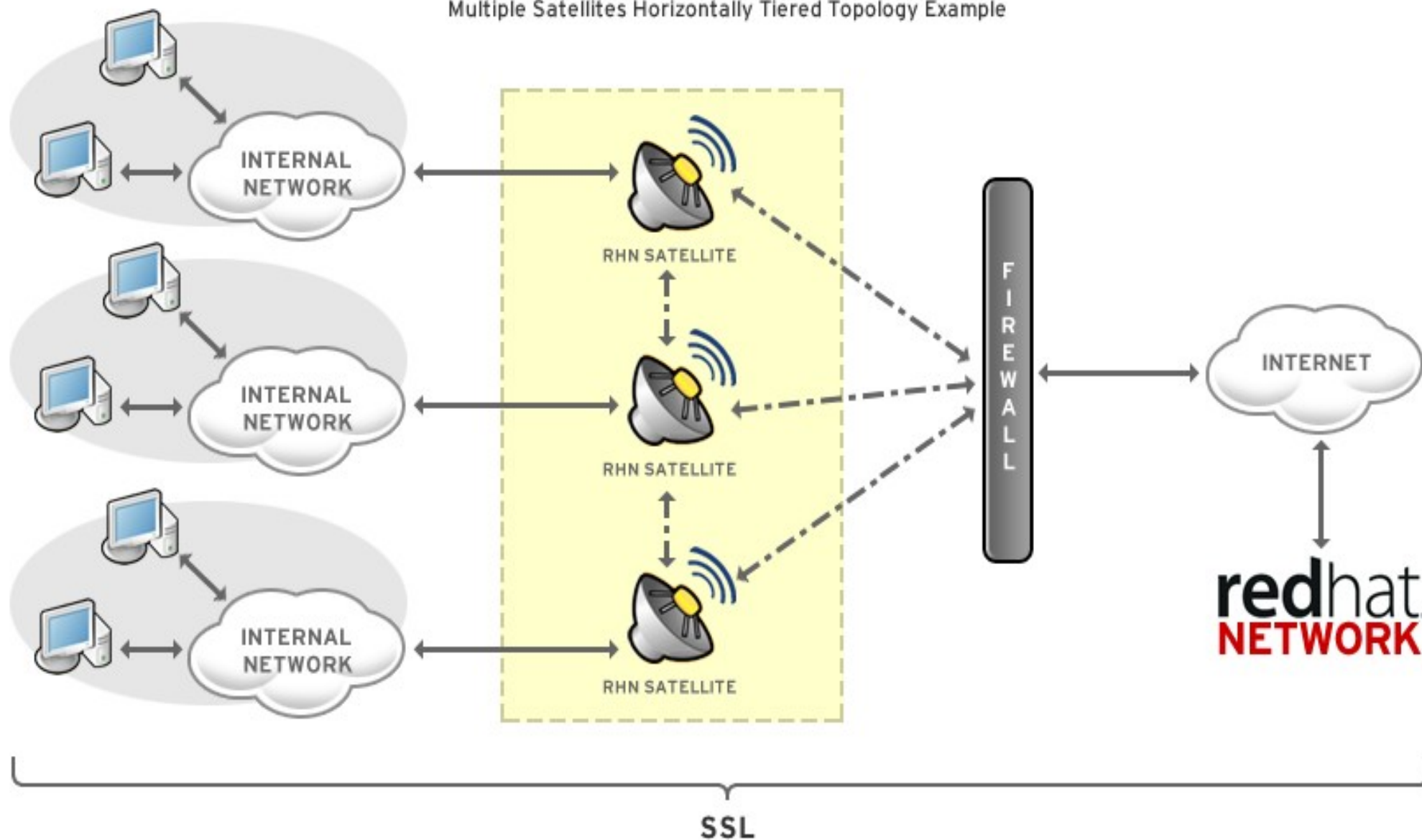
Single Satellite Topology Example





## RHN SATELLITE

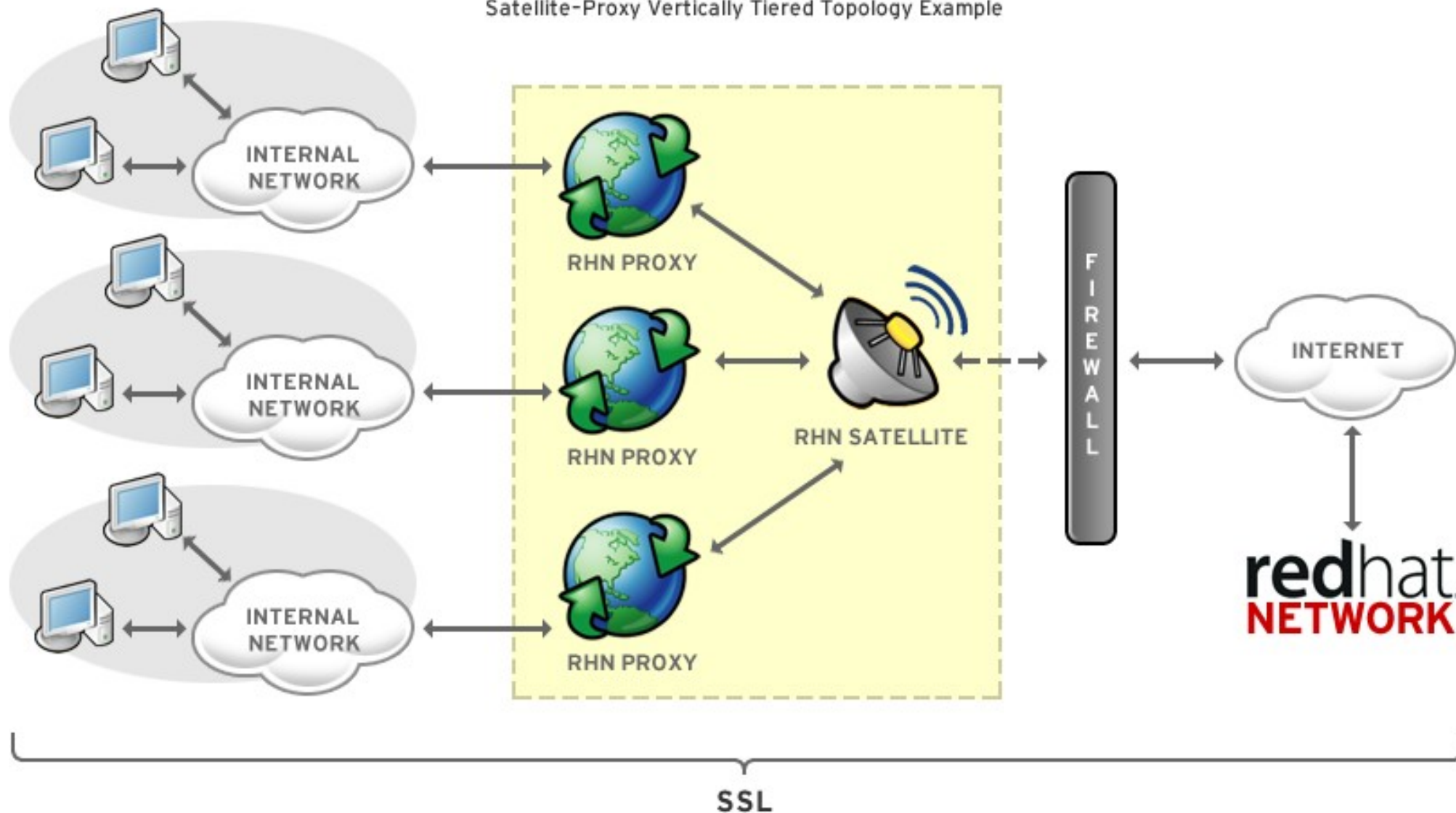
Multiple Satellites Horizontally Tiered Topology Example





## RHN SATELLITE-PROXY

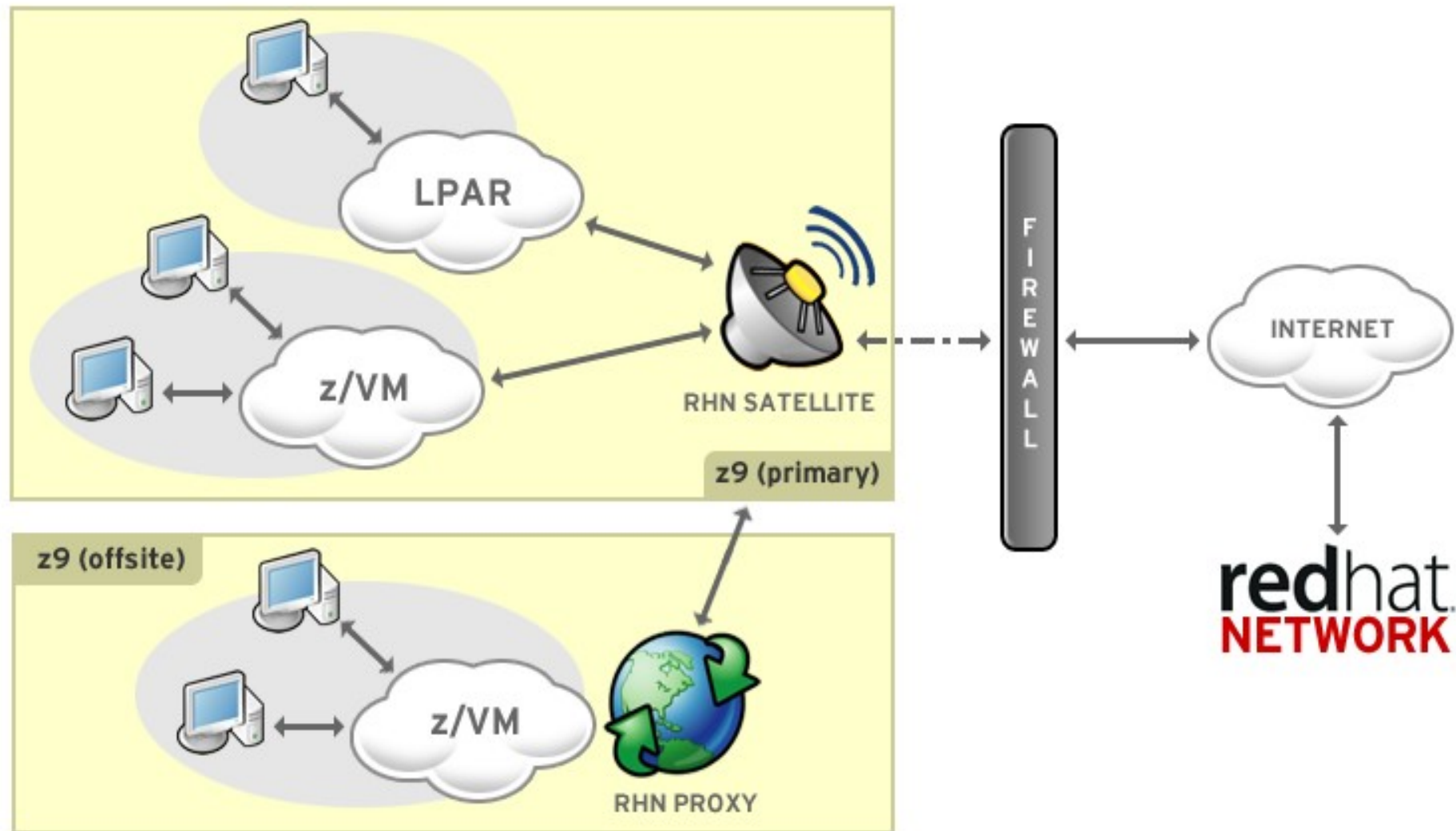
Satellite-Proxy Vertically Tiered Topology Example



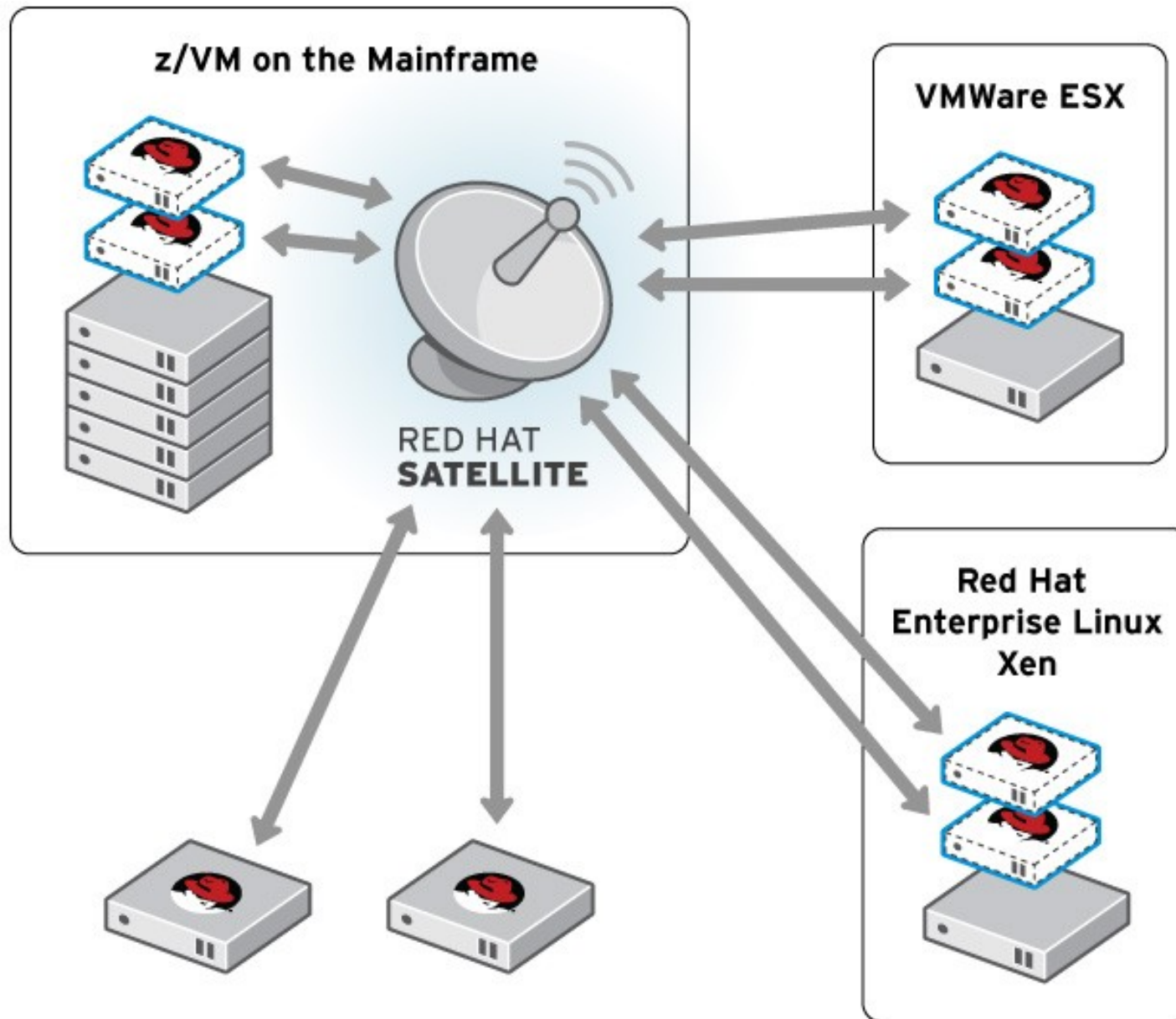


## RHN SATELLITE-PROXY

Satellite-Proxy System z Topology Example



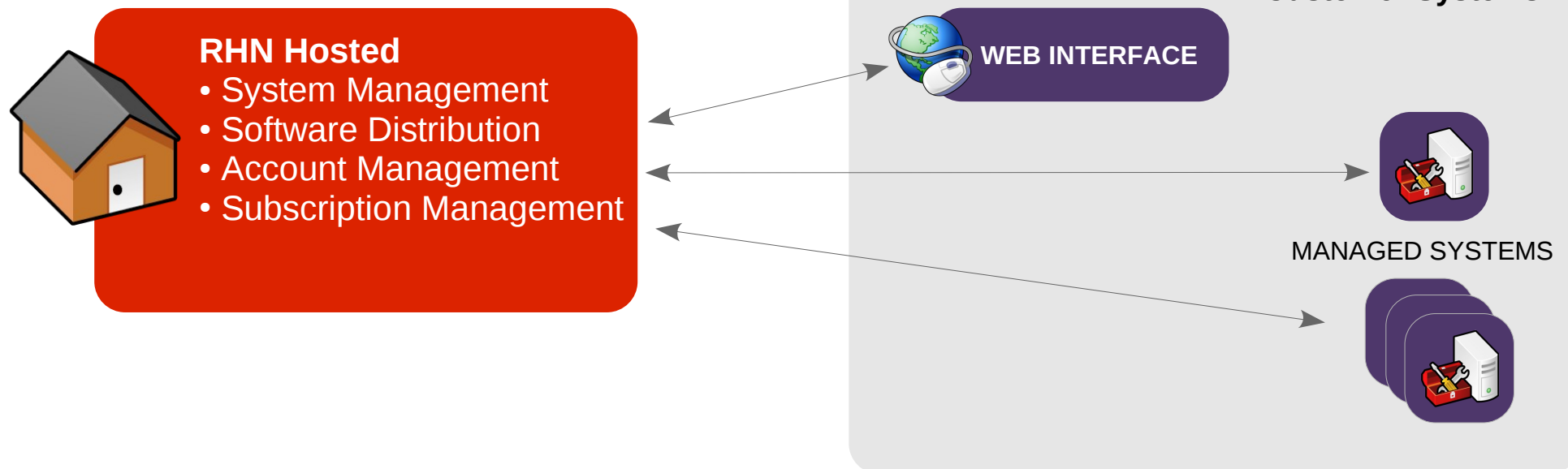




# Red Hat Network Hosted



**RED HAT NETWORK**  
:: Enterprise Systems Management

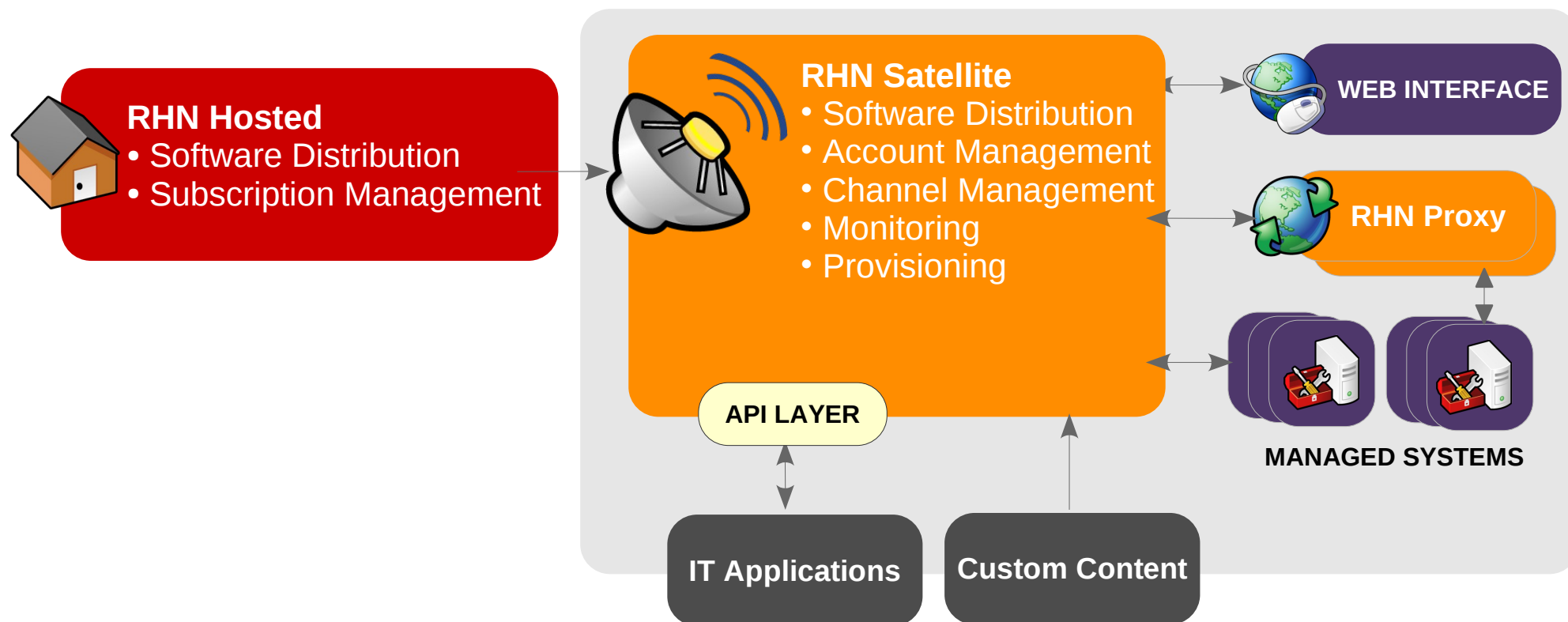


- Quick setup is designed for rapid and efficient management for small deployments
- All system information, profiles, and packages are stored in Red Hat's servers
- Each managed system connects across the Internet for all managed actions

# Red Hat Network Satellite



**RED HAT NETWORK**  
:: Enterprise Systems Management



- Enterprise management solution – enhanced control
- Synchronizes content with RHN Hosted, another Satellite, or physical media
- Custom content distribution

# Red Hat Network Satellite



RED HAT NETWORK  
:: Enterprise Systems Management

## Update



Easily obtain  
security updates,  
patches, and new OS  
versions



Remove undesired  
packages through  
the simple RHN web  
interface



Automatically update  
systems with the  
latest security fixes



Systems ▼

Search

 NO SYSTEMS SELECTED [ [MANAGE](#) | [CLEAR](#) ]

[Your RHN](#)  
[Your Account](#)  
[Your Preferences](#)  
[Locale Preferences](#)  
[Subscription Management](#)
**DOWNLOAD SOFTWARE**

**BUY NOW!**

Add systems

## Your RHN <sup>?</sup>

### Tasks

- **Search** for: [Packages](#) | [Systems](#)
- Manage **Entitlements** & **Subscriptions**
- **Register** Systems
- Manage **Activation Keys**
- Manage **Kickstarts**
- Manage **Configuration Files**

### Inactive Systems

 <a href="#">IAD_DevBox</a>	49 Week(s)
 <a href="#">RHT-IAD_turtle</a>	51 Week(s)
 <a href="#">sandp</a>	57 Week(s)
 <a href="#">DEMOS-utility-app-01</a>	59 Week(s)
 <a href="#">DEMOS-mls-app-02</a>	59 Week(s)











[View All Inactive Systems \(16\)](#)

## Most Critical Systems

System Name	All Updates	Security Errata	Bugfix Errata	Enhancement Errata
RHT_Laptop	570	 149	 362	 59
beltbuckle	479	 115	 308	 56
IAD_DevBox	479	 112	 317	 50
IAD_DevBox1	388	 82	 259	 47
RHT-IAD_turtle	205	 41	 141	 23

1 - 5 of 5 'Most Critical' systems displayed

[View All Critical Systems](#)

Relevant Security Errata	Severity		Systems	Updated
 <a href="#">RHSA-2009:1060</a>	Important	Important: pidgin security update	0	5/22/09
 <a href="#">RHSA-2009:1061</a>	Important	Important: freetype security update	0	5/22/09
 <a href="#">RHSA-2009:0329</a>	Important	Important: freetype security update	0	5/22/09
 <a href="#">RHSA-2009:1024</a>	Important	Important: Red Hat Enterprise Linux 4.8 kernel security and bug fix update	0	5/18/09
 <a href="#">RHSA-2009:0955</a>	Moderate	Moderate: nfs-utils security and bug fix update	0	5/18/09
 <a href="#">RHSA-2009:0981</a>	Low	Low: util-linux security and bug fix update	0	5/18/09
 <a href="#">RHSA-2009:1036</a>	Important	Important: ipsec-tools security update	0	5/18/09
 <a href="#">RHSA-2009:1039</a>	Important	Important: ntp security update	0	5/18/09
 <a href="#">RHSA-2009:0478</a>	Critical	Critical: acroread security update	0	5/13/09
 <a href="#">RHSA-2009:0480</a>	Important	Important: poppler security update	0	5/13/09

1 - 10 of 241 relevant errata displayed

[View All Errata](#) | [View All Relevant Errata](#)

# Red Hat Network Satellite



**RED HAT NETWORK**  
:: Enterprise Systems Management

## Update



Easily obtain security updates, patches, and new OS versions



Remove undesired packages through the simple RHN web interface



Automatically update systems with the latest security fixes

## Management



Manage groups of systems as easily as a single system



Assign permissions to administrators for managing different groups or roles



Schedule updates to occur during maintenance windows

[Overview](#)[Systems](#)[System Groups](#)[System Set Manager](#)[Advanced Search](#)[Activation Keys](#)[Stored Profiles](#)[Custom System Info](#)[Kickstart](#)

# System Set Manager

[Overview](#)[Systems](#)[Errata](#)[Packages](#)[Groups](#)[Channels](#)[Configuration](#)[Provisioning](#)[Misc](#)

## Overview

Welcome to the System Set Manager. This interface will allow you to easily work with large numbers of systems in the Spacewalk.

The following tabs aid you in a number of tasks:



**Systems:** [List the systems](#) you have selected to work with



**Errata:** [Schedule errata updates](#) relevant to selected systems



**Packages:** [Upgrade](#) / [Install](#) / [Remove](#) / [Verify](#) packages



**Groups:** [Create](#) and [manage](#) groups



**Channels:** Manage systems' [channel memberships](#)  
Manage systems' [config channel subscriptions](#)  
[Deploy](#) / [Diff](#) config channels



**Provisioning:** [Kickstart](#) systems  
[Tag](#) systems for [snapshot rollback](#)  
Run [remote commands](#)



**Misc:** Update [hardware/package profiles](#) and [system preferences](#)  
[Set](#) and [remove](#) custom values for selected systems  
[Add or Remove Add-On Entitlements](#)

Overview

Systems

All

Virtual Systems

Out of Date

Unentitled

Ungrouped

Inactive

Recently  
Registered

Proxy

System Groups

System Set  
Manager

Advanced Search

Activation Keys

Stored Profiles

Custom System  
Info

Kickstart

System Legend



OK



Critical



Warning

## Virtual Systems

Filter by System: coe.muc.redha Go

1 - 20 of 66 (2 selected)

	System	Updates	Status	Base Software Channel
<input type="checkbox"/>	Host: inf01.coe.muc.redhat.com 3 Active Virtual Systems, 4 Total. (View All)			
<input type="checkbox"/>	└ vinf02.coe.muc.redhat.com		Running	Red Hat Enterprise Linux (v. 5 for 32-bit x86)
<input type="checkbox"/>	└ vinf03.coe.muc.redhat.com		Stopped	Red Hat Enterprise Linux AS (v. 4 for 32-bit x86)
<input type="checkbox"/>	Host: storage03.coe.muc.redhat.com 0 Active Virtual Systems, 0 Total. (View All)			
<input type="checkbox"/>	Host: inf02.coe.muc.redhat.com 2 Active Virtual Systems, 2 Total. (View All)			
<input type="checkbox"/>	└ vinf05.coe.muc.redhat.com		Running	Red Hat Enterprise Linux (v. 5 for 32-bit x86)
<input type="checkbox"/>	└ vinf06.coe.muc.redhat.com		Running	Red Hat Enterprise Linux (v. 5 for 32-bit x86)
<input type="checkbox"/>	Host: hv001.coe.muc.redhat.com 1 Active Virtual Systems, 28 Total. (View All)			
<input type="checkbox"/>	└ vm019.coe.muc.redhat.com		Stopped	Red Hat Enterprise Linux AS (v. 4 for 32-bit x86)
<input type="checkbox"/>	└ vm013.coe.muc.redhat.com		Stopped	Red Hat Enterprise Linux (v. 5 for 32-bit x86)
<input type="checkbox"/>	└ vm013.coe.muc.redhat.com		Stopped	Red Hat Enterprise Linux (v. 5 for 32-bit x86)
<input type="checkbox"/>	└ vm040.coe.muc.redhat.com		Stopped	Red Hat Enterprise Linux AS (v. 4 for 32-bit x86)
<input type="checkbox"/>	└ vm013.coe.muc.redhat.com		Stopped	Red Hat Enterprise Linux (v. 5 for 32-bit x86)
<input type="checkbox"/>	└ vm013.coe.muc.redhat.com		Stopped	Red Hat Enterprise Linux (v. 5 for 32-bit x86)
<input type="checkbox"/>	└ vm013.coe.muc.redhat.com		Stopped	Red Hat Enterprise Linux (v. 5 for 32-bit x86)
<input type="checkbox"/>	└ vm003.coe.muc.redhat.com		Stopped	Red Hat Enterprise Linux AS (v. 4 for 32-bit x86)
<input type="checkbox"/>	└ vm045.coe.muc.redhat.com		Stopped	Red Hat Enterprise Linux AS (v. 4 for 32-bit x86)
<input type="checkbox"/>	└ vm013.coe.muc.redhat.com		Stopped	Red Hat Enterprise Linux (v. 5 for 32-bit x86)

# Red Hat Network Satellite



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:: Enterprise Systems Management

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## Provisioning



Provision existing or bare metal systems using profiles or system cloning



Improve consistency by using RHN to manage and deploy configuration files



Undo problematic changes with snapshots and rollback



Overview

Systems

System Groups

System Set Manager

Advanced Search

Activation Keys

Stored Profiles

Custom System Info

Kickstart

Profiles

Bare Metal

GPG and SSL Keys

Distributions

File Preservation



## Kickstart: rhel-5-i386-server\_default\_part\_novirt

[Kickstart Details](#)
[System Details](#)
[Software](#)
[Activation Keys](#)
[Scripts](#)
[Kickstart File](#)

### Kickstart File

The kickstart file generated by this kickstart profile is viewable below:

[Download Kickstart File](#)

```
# Kickstart config file generated by RHN Config Management
#
# Profile Name : rhel-5-i386-server_default_part_novirt
# Profile Label : rhel-5-i386-server_default_part_novirt
# Date Created : 2008-06-03 20:40:03.0
#

install
text
network --bootproto dhcp
url --url http://devel13.z900.redhat.com/ty/MwPJrTGI
lang en_US
langsupport --default en_US en_US
keyboard us
mouse none
zerombr yes
clearpart --all
part /boot --fstype=ext3 --size=200
part pv.01 --size=1000 --grow
part swap --size=1000 --maxsize=2000
volgroup myvg pv.01
logvol / --vgname=myvg --name=rootvol --size=1000 --grow
bootloader --location mbr
timezone America/New_York
auth --enablemd5 --enablesshadow
rootpw --iscrypted $1$OKAzMj1I$V05gL5mVVj9T09GidA/Y6/
selinux --permissive
reboot
firewall --disabled
skipx
repo --name=Cluster --baseurl=http://devel13.z900.redhat.com/kickstart/dist/ks-rhel-i386-server-5-u1/Cluster
repo --name=ClusterStorage --baseurl=http://devel13.z900.redhat.com/kickstart/dist/ks-rhel-i386-server-5-u1/ClusterStorage
repo --name=VT --baseurl=http://devel13.z900.redhat.com/kickstart/dist/ks-rhel-i386-server-5-u1/VT
repo --name=Workstation --baseurl=http://devel13.z900.redhat.com/kickstart/dist/ks-rhel-i386-server-5-u1/Workstation
```

[Overview](#)
[Systems](#)
[System Groups](#)
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[Stored Profiles](#)
[Custom System Info](#)
[Kickstart](#)


## Custom System Info Keys

[+ create new key](#)

Custom system info keys allow your administrators to store relevant custom key/value pairs with your system profiles. Custom system info is fully [searchable](#).

The following custom system info keys have been defined for your organization.

1 - 2 of 2

Key	Description	Systems with value	Last Modified
<a href="#">Hardware Support Tag</a>	Vendor hardware support tags.	0	2008-06-15 10:43:13
<a href="#">Support Contract</a>	"Yes" or "No", whether or not the system is support	0	2008-06-15 10:44:51

1 - 2 of 2



# Red Hat Network Satellite



**RED HAT NETWORK**  
:: Enterprise Systems Management

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Provision existing or bare metal systems using profiles or system cloning



Improve consistency by using RHN to manage and deploy configuration files



Undo problematic changes with snapshots and rollback

## Monitoring



Dozens of low-impact probes can be set for each system



Group probes into suites for fast deployment



Receive email or pager notices when a probe reaches warning or critical threshold



# How It Works



# How It Works

## ■ Database

Your existing database (standalone) or bundled (embedded Oracle 9i R2)

## ■ RHN Satellite Server

- Entry point for *Red Hat Update Agent* running on clients
- Apache HTTP server serving XML-RPC requests)

## ■ RHN Satellite Web Interface

- Advanced system, system group, user, and channel management interface

## ■ RPM Repository

- Package repository for Red Hat RPM packages as well as middleware/custom RPM packages.



# How It Works

## ■ Management Tools

- Database and file system synchronization tools
- RPM importing tools
- Channel maintenance tools (Web based)
- Errata management tools (Web based)
- User management tools (Web based)
- Client system and system grouping tools (Web based)
- *Red Hat Update Agent* on the client systems



# RHN Satellite: Apache

- Apache processes within RHN Satellite handle multiple types of requests
  - Satellite Web UI with perl and java components
  - /XMLRPC, /API & /APPLET via python
- Main configuration files
  - /etc/httpd/conf/httpd.conf
  - /etc/httpd/conf/rhn/
  - /etc/rhn/rhn.conf
- Runs with standard httpd daemon on ports 80 and 443
- Apache writes to various log files in the follow locations
  - /var/log/rhn/
  - /var/log/httpd/
- Misc files of note
  - SSL Certificates used by Apache
  - /  
etc/httpd/conf/ssl.key/server.key
  - /  
etc/httpd/conf/ssl.crt/server.crt



# RHN Satellite: Java & RHN Push

- Tomcat is communicated to via Apache for portions of the Java Web UI within RHN Satellite 4.0
- Main configuration file
  - `/etc/tomcat5/tomcat5.conf`
- Main log directory
  - `/var/log/tomcat5/`
- Tomcat daemon listens to ports
  - 8005
  - 8009
  - 8080
- The jabber protocol is used by RHN to push scheduled actions to systems.
  - Satellite connects to jabber (osa-dispatcher)
  - Clients connect to jabber (osad)
- Main configuration files for push technology
  - `/etc/jabberd/jabberd.cfg`
  - `/etc/rhn/rhn.conf`
- Main log files are
  - `/var/log/messages`
  - `/var/log/rhn/osa-dispatcher.log`



# Installation Requirements

## ■ Software

- RHEL 4 (31-bit or 64-bit)
- @Base install

## ■ Hardware

- 1 to 2 (virtual) IFLs
- 2 to 4 GB storage (memory)
- 1 GB swap (combination VDISK, disk)
- 1 x mod3 for OS install
- Estimated 12 GB disk space for embedded database
- 6 GB per channel (disk)



# Installing RHN Satellite

- `mount -o loop iso_filename /media/`
- `cd /media; ./install.pl`
  - `./install.pl --help`
  - `./install.pl --disconnected`
- Installer steps
  - Create database
  - Import Satellite certificate
  - Register/Activate Satellite
  - Generate CA certificate for SSL traffic





# Importing Packages (satellite-sync)

- **Synchronize metadata/packages with RHN**
  - Satellite connected to RHN
- **Internal steps**
  - channel-families – Import/sync channel family (architecture) data
  - channels – Import/sync channel data
  - rpms – Import/sync RPMs
  - packages – Import/sync full package data for RPMs retrieved successfully
  - errata – Import/sync Errata information



# Importing Packages (disconnected)

- **Synchronize metadata/packages from Channel Content ISO**
  - Released shortly after each RHEL update on RHN, then in regular increments
- **Use channel data from another Satellite**
  - rhn-satellite-exporter exports channel families, architectures, channel metadata, blacklists, RPMs, RPM metadata, errata, and kickstarts
  - rhn-satellite-exporter --dir=/var/sat-backup/
  - scp -r storage.example.com:/var/sat-backup/\* /var/rhn-sat-import
  - satellite-sync --list-channels --mount-point /var/rhn-sat-import
  - satellite-sync -c rhel-s390x-as-4 --mount-point /var/rhn-sat-import
  - Can specify multiple channels in one command. Estimate ~2 hours per channel.



# **Something Broke!**

## **Now What?**



# Further Information

## Problem

- Where can I find further information on RHN Satellite?

## Solution

- Red Hat Knowledgebase
  - <http://kbase.redhat.com/faq/>
- RHN Documentation
  - <https://rhn.redhat.com/help/>
- RHN Satellite Users mailing list
  - <https://www.redhat.com/mailman/listinfo/rhn-satellite-users>
- RHN Satellite comes with 24/7 support
  - <https://www.redhat.com/apps/support/>



# Contacting Support

## Problem

- My Satellite is not working, what should I do?

## Solution

- 1) Gather data, include
  - RHN Satellite Debug
  - System Report
  - RHN Proxy Debug (if needed)

```
/usr/bin/satellite-debug
```

```
/usr/sbin/sysreport
```

```
/usr/bin/rhn-proxy-debug
```

- 2) Contact Red Hat Support with data



## **Where's This Used? (On System z)**

**The following slides are from the Salt  
River Project Webinar, record online.  
[Viewable By Clicking Here](#)**

# Salt River Project (SRP)

- One of Arizona's largest utilities providers, Salt River Project (SRP) has delivered low-cost, reliable power and water to Arizona customers for over 100 years. SRP includes two entities: the Salt River Project Agricultural Improvement and Power District, a political subdivision of the state of Arizona, and the Salt River Valley Water Users' Association, a private corporation.
- The District provides electricity to more than 935,000 retail customers in the greater Phoenix metropolitan area. It operates or participates in 11 major power plants and numerous other generating stations, including thermal, nuclear, natural gas, and hydroelectric sources.
- The mission of SRP is to deliver ever-improving contributions to the people it serves through the provision of low-cost, reliable water and power, and community programs, to ensure the vitality of the Salt River Valley.



# Salt River Project

## FAST FACTS

- **Industry:** Utilities, Government
- **Geography:** Arizona
- **Challenge:** Searched for a replacement for proprietary UNIX software which could provide greater flexibility, manageability, and utilization opportunities
- **Migration Path:** HP-UX to Red Hat Enterprise Linux
- **Software:** Red Hat Enterprise Linux, Red Hat Network Satellite
- **Hardware:** IBM System z Mainframe and HP ProLiant Blades
- **Benefits:** Experienced cost savings, boosted performance, stable and reliable management, consolidation, and valuable technical support after migrating to Red Hat Enterprise Linux on IBM System z and HP ProLiant Blades



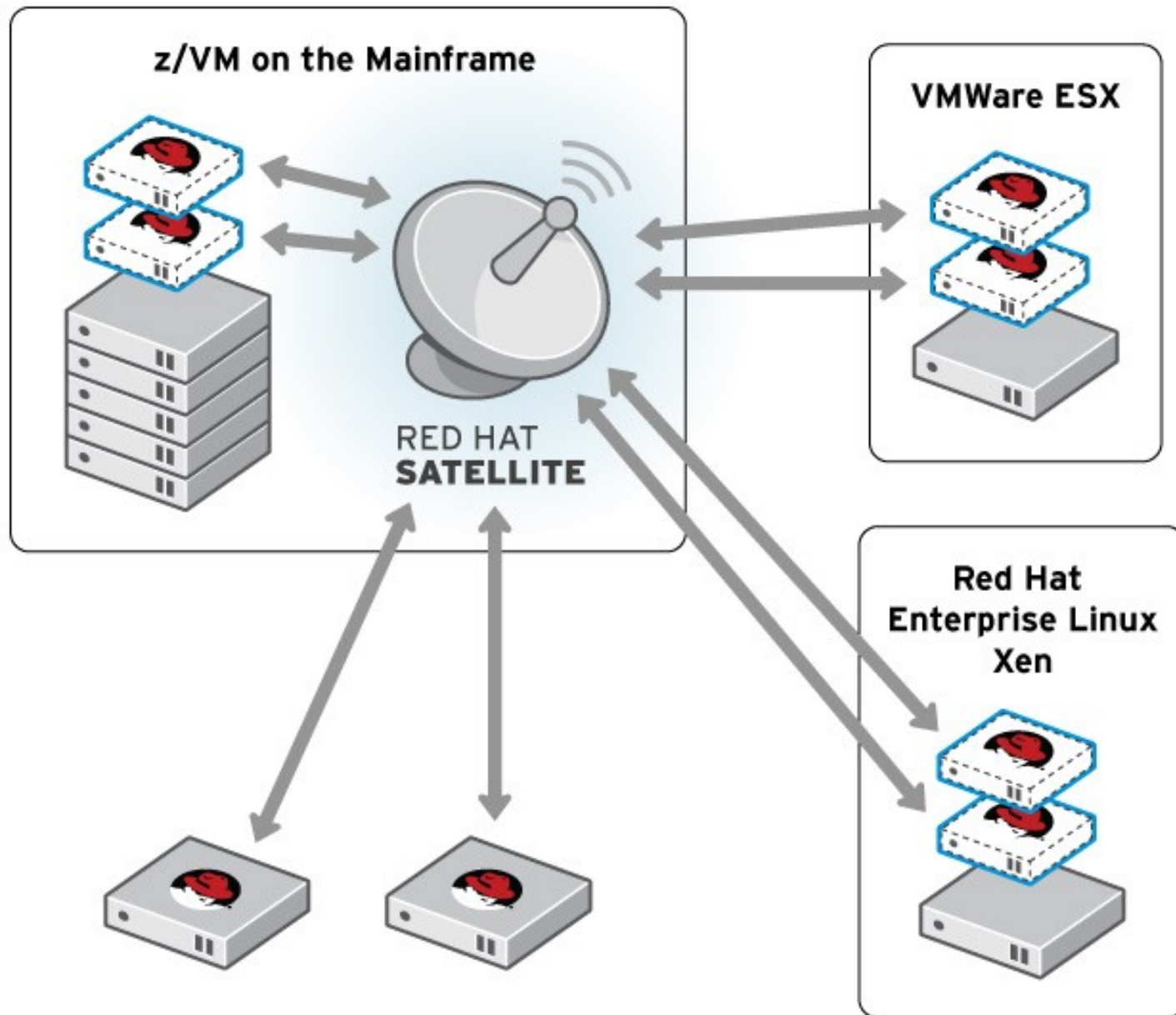
# The Problem

- RHEL/Linux started small in use but grew (sound familiar?)
- SRP had been testing Linux in-house for approximately three years, but didn't have any Linux solutions in production environments.
- In 2006, SRP upgraded its System z Mainframe.
  - Prompted an accelerated investigation into running Linux on the IFL.
- Our HP RISC hardware was nearing EOL.
  - A project was already in place evaluating staying on UNIX or transitioning to Linux.
- Server sprawl in our Windows environment was a serious problem - we had to offer a better solution with Linux or UNIX.

# What Happened?

- Selected Red Hat Enterprise Linux, to use in both the mainframe and distributed environments.
- To manage nearly 50 servers, we chose Red Hat Network Satellite.
- Satellite is fully supported by Red Hat on the mainframe. This is where we run it and we're very happy with the performance.
- Our use of Satellite has grown with us and has saved us time by making our admins more efficient.
- RHN Satellite pays off very quickly as your environment grows.

# Salt River Project Environment



# Key Features That Brought Value

## -- Patch Management

- Visibility of which systems need to be patched.
- Easy to push patches out via OSAD.
- Confirmation of deployment and instant access to progress.
- History log of results.
- Rollbacks.
  - Satellite allows you to create 'snapshots' of the current package manifest for a system.
  - Incrementally rollback each patch easily.

### Management



Manage groups of systems  
as easily as a single  
system



Assign permissions to  
administrators for  
managing different groups  
or roles



Schedule updates to occur  
during maintenance  
windows

# Key Features That Brought Value

## -- Provisioning New Systems

- Satellite provides complete control over kickstarts.
  - We have about 20 different kickstarts representing our various server builds.
  - We often make copies of kickstarts and then minor tweaks to them to accomodate small variations, such as the storage device (`/dev/sda` vs. `/dev/mapper/mpath0`).
- We employ PXE to deploy new servers.
  - Each PXE bootstrap image points to a kickstart residing on Satellite.

### Provisioning



Provision existing or bare metal systems using profiles or system cloning



Improve consistency by using RHN to manage and deploy configuration files



Undo problematic changes with snapshots and rollback

# Key Features That Brought Value

## -- Remote Commands, 'Real Time' Agent

- Remote commands can be executed on machines configured to allow it.
- Central management, tasks can be done quickly on many machines all at once.
- With the OSAD service installed on a system, events happen right away; the system picks up the event and runs it on demand.

# Key Features That Brought Value

## -- Inventory

- Satellite keeps detailed information on systems
  - Mac addresses, hardware details, etc.
  - User specified information (location, notes, etc).
    - API available to access (or write) this info.
  - Fully searchable, can select machines to manage based on searches of system information.
  - Much faster than HP iLO for querying hardware info.
- Satellite keeps track of packages on systems
  - Allows us to do searches for specific packages to see if they're installed on a system or group of systems.
  - Package synchronization between systems. Critical for clusters.



# Key Features That Brought Value

## -- Support

- 24/7 Premium Support standard with RHN Satellite
- Training Courses available
- Professional Services available
- Web support is convenient but use phone support for time-sensitive, critical issues.
  - Phone support connects you to an RHCE.

# Results After Deploying Satellite

- A kickstart & management environment that is simple, reliable, and verifiable.
  - New systems deployed over twice as fast.
  - Deploying system changes (files, rpms) 3-5x faster (minutes).
- Greater system uptime and availability due to fewer human errors.
- Leverages the benefits of running on the mainframe.
- A single administrator can make a change on hundreds of machines in minutes, and know the results immediately.
- Automatic logging of changes allows administrators to quickly and easily discover changes previously made by other administrators to a given system.

# Summary

## ■ **Deploy new systems faster and easier**

- Satellite Provisioning makes it much easier to roll out new systems.

## ■ **Manage more systems**

- Satellite is built to handle thousands of managed systems.
- Satellite uses an intuitive web GUI that makes it easy to work with groups of systems.

## ■ **Reduce errors**

- Centralized configuration file management reduces the opportunity for errors or inconsistencies.
- Less human errors = greater system uptime.

## ■ ***Next Step - Evaluate Satellite***

- *Contact your Red Hat Account Executive to evaluate Satellite in your Environment.*

# Questions





# Open Discussion